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## U.S. Insurer Derivative Exposure Increased in 2017

Analyst: Jean-Baptiste Carelus

### Executive Summary

- As of year-end 2017, 311 U.S. insurers reported exposure to derivatives, which is virtually unchanged from the 310 in 2016, but significantly more than the 208 reported in 2015.
- The notional value of derivative exposure rose 4% to about \$2.4 trillion as of year-end 2017 from \$2.3 trillion as of year-end 2016.
  - Swaps accounted for 48% of the total notional value, followed by Options (43%), Futures (5%) and Forwards (3%).
  - Hedging was the main purpose for U.S. insurers' use of derivatives at 95% of the total notional value (\$2.2 trillion).
  - Life companies accounted for 96% of the total notional value, followed by Property/Casualty (P/C) at 4% with Fraternal and Health companies combined at less than 1%.

The *Statement of Statutory Accounting Principles (SSAP) No. 86—Derivatives* defines a “derivative instrument” as “an agreement, option, instrument or a series or combination thereof:

- a) To make or take delivery of, or assume or relinquish, a specified amount of one or more underlying interests, or to make a cash settlement in lieu thereof; or
- b) That has a price, performance, value or cash flow based primarily upon the actual or expected price, level, performance, value or cash flow of one or more underlying interests.”

Over the seven-year period (2010-2017), the notional value of U.S. insurers' derivative exposure increased from about \$1.1 trillion to \$2.4 trillion. U.S. insurers primarily used derivatives to hedge risks (e.g., interest rate risk, credit risk, currency risk and equity risk) and, to a lesser extent, replicate assets and generate additional income.

In this special report, note that most U.S. insurer derivative exposures are in terms of notional value, which is the nominal or face amount of a financial instrument that is used to calculate payments made on that instrument. Notional values are often not indicators of true economic exposure, but they serve as a more consistent indicator of market activity and scale than the book/adjusted carrying value (BACV) or the fair value (FV), both of which can be affected by factors such as market prices and accounting treatment.

The NAIC's Capital Markets Bureau published a primer on derivatives on June 26, 2018, providing a detailed overview of types and uses of derivatives by the U.S. insurance industry. This special report summarizes U.S.

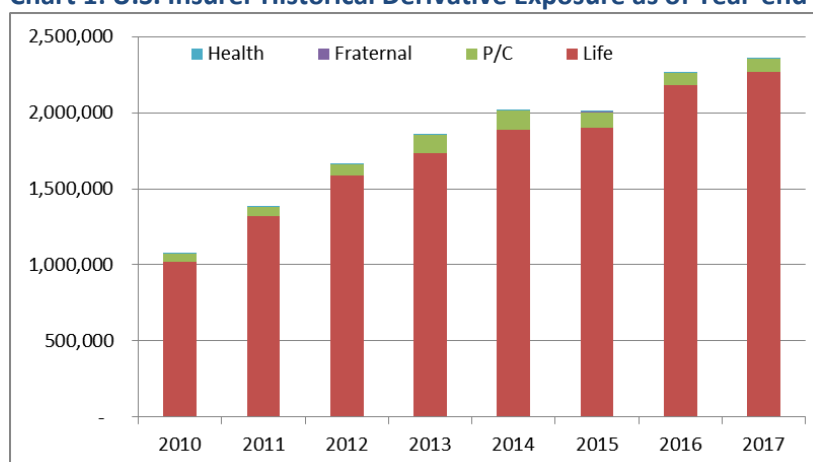
insurer derivative exposure by derivative type, purpose/strategy and type of risk as of year-end 2017. This special report is also an update to the NAIC Capital Markets Bureau’s previously published special report on U.S. insurer derivative exposure, titled *Update on the Insurance Industry’s Use of Derivatives and Exposure Trends*, dated March 23, 2017.

### U.S. Insurer Derivative Use in 2017

Use of derivatives is not widespread in the U.S. insurance industry. U.S. insurers that reported having derivative exposure significantly increased to 310 in 2016 from 208 in 2015; and it leveled off at 311 in 2017 with 7% of U.S. insurers reporting having derivative exposure. Life companies accounted for 217 (70%) of the 311; they also represented 30% of the 720 total life companies that filed an Annual Statement in 2017. Among P/C companies, 78 out of 2,553 reported having derivative exposure.

The amount of U.S. insurers’ derivative exposure, as measured by the notional value, was \$2.4 trillion as of year-end 2017, a 4.2% increase from \$2.3 trillion in 2016 (see Chart 1 for the historical derivative exposure of U.S. insurers). Life companies accounted for 96% of the reported notional value at \$2.3 trillion, followed by P/C companies which accounted for the remaining 4% of the notional value.

**Chart 1: U.S. Insurer Historical Derivative Exposure as of Year-end 2017 (\$Mil., Notional)**



As of year-end 2017, Swaps were the largest derivative type reported, accounting for 48% of total derivative exposure. Table 1 and Table 2 show that Swaps increased 6% to \$1.1 trillion as of year-end 2017, from \$1 trillion as of year-end 2016. Options (the second largest derivative type) represented 43% (\$1 trillion) of the total notional value of derivative exposure as of year-end 2017, up from 39% (\$876 billion) in 2016. Futures and Forwards represented 5% and 3%, respectively, of the total notional value of derivative exposure as of year-end 2017.

**Table 1: U.S. Insurer Derivatives Type as of Year-end 2017 (\$Mil., Notional)**

Industry	Swaps	Options	Futures	Forwards	Total	Pct of Total
Life	1,119,290	965,886	123,738	61,618	2,270,532	96%
P/C	17,120	57,328	3,266	6,233	83,947	4%
Fraternal	444	721	344		1,509	0%
Health	210		27	109	346	0%
<b>Total</b>	<b>1,137,064</b>	<b>1,023,935</b>	<b>127,376</b>	<b>67,960</b>	<b>2,356,335</b>	<b>100%</b>
Pct of Total	48%	43%	5%	3%	100%	

**Table 2: U.S. Insurer Derivative Type as of Year-end 2016 (\$Mil., Notional)**

Industry	Swaps	Options	Futures	Forwards	Total	Pct of Total
Life	1,052,436	825,635	215,481	86,361	2,179,914	96%
P/C	18,782	50,179	4,456	6,646	80,063	4%
Fraternal	192	560	344	-	1,097	0%
Health	210	-	106	166	482	0%
<b>Total</b>	<b>1,071,620</b>	<b>876,375</b>	<b>220,388</b>	<b>93,173</b>	<b>2,261,556</b>	<b>100%</b>
Pct of Total	47%	39%	10%	4%	100%	

**Hedging and Hedging Effectiveness**

On Schedule DB (which includes Options, Caps, Floors, Collars, Swaps and Forwards), hedges are classified as either “Hedging Effective” or “Hedging Other.”

Given strict criteria and the extensive documentation required, many hedges are not deemed effective<sup>1</sup> for accounting purposes, but they still provide strategic value; these positions, reported as “Hedging Other” on Schedule DB, are still intended to reduce risk, but they simply do not meet the accounting and documentation requirements.

U.S. insurer derivative exposure was mainly focused on hedging at 95% (\$2.2 trillion) of the total notional value, with “Hedging Other” at 85% of the total. Other purposes for U.S. insurers engaging in derivative transactions were reported as Other Strategies (3%), Replication (2%) and Income Generation (less than 1%). (See Table 3.)

**Table 3: U.S. Insurers’ Derivative Exposure by Purpose/Strategy as of Year-end 2017 (\$Mil., Notional)**

Industry	Hedging Other	Hedging Effective	Other	Replication	Income Generation	Total
Life	1,930,526	239,775	54,684	45,487	61	2,270,532
P/C	65,680	2,576	14,626	1,008	58	83,947
Fraternal	1,165	259	0	85	-	1,509
Health	109	200	37	-	-	346
<b>Total</b>	<b>1,997,480</b>	<b>242,810</b>	<b>69,347</b>	<b>46,579</b>	<b>119</b>	<b>2,356,335</b>
Pct of Total	85%	10%	3%	2%	0%	100%

According to SSAP No. 86, derivatives used in effective hedges are valued and reported in a manner consistent with the hedged asset or liability (“hedge accounting”). Derivative instruments used in transactions that are not deemed hedge-effective are reported at FV, and changes in the FV are recorded as unrealized gains or losses (“FV accounting”). In those cases, the BACV would reflect the changes in value. Hedge accounting, then, helps limit volatility in financial reporting. As shown in Table 3, the proportion of hedges classified as hedging effective as of year-end 2017, was 10% and unchanged from 2016; it has ranged between 7% and 12% between 2014 and 2017.

<sup>1</sup> A hedge generally is considered effective when “the change in fair value of the derivative hedging instrument is within 80% to 125% of the opposite change in fair value of the hedged item attributable to the hedged risk.” A hedge also can be designated as effective “when an R-squared of 0.80 or higher is achieved when using a regression analysis technique.”

## Swap Exposure as of Year-end 2017

As of year-end 2017, U.S. insurers' total Swap exposure had increased 6% from the previous year, with the largest increase occurring in Currency Swaps (20%), followed by Interest Rate Swaps (7%) and Other (4%). U.S. insurers' Swap exposure to total return and credit default swaps (CDS) decreased 14% and 11%, respectively, as of year-end 2017. (See Table 4.)

**Table 4: U.S. Insurers' Swap Exposure by Contract Type as of Year-end 2017 (\$Mil., Notional)**

Industry	Interest Rate	Currency	Total Return	Credit Default Swap	Other	Total
Life	900,874	100,512	65,384	32,691	19,829	1,119,290
P/C	9,998	2,941	1,209	1,701	1,271	17,120
Fraternal	15	429	-	-	-	444
Health	210	-	-	-	-	210
<b>Total</b>	<b>911,097</b>	<b>103,883</b>	<b>66,593</b>	<b>34,393</b>	<b>21,100</b>	<b>1,137,064</b>
Pct of Total	80%	9%	6%	3%	2%	100%

As of year-end 2017, Interest Rate Swaps, the largest type reported by U.S. insurers, accounted for 80% (\$911 billion) of the total notional value of Swap agreements reported by U.S. insurers. (See Table 5.)

Currency Swaps accounted for 9% of U.S. insurers' total swap notional value, followed by Total Return Swaps at 6% of the total notional value. The notional value of CDSs accounted for about 3% of the total notional value for U.S. insurers as of year-end 2017.

As of year-end 2017, the vast majority of Swaps were for hedging purposes (96%), as shown in Table 5.

**Table 5: Swap Exposure by Type and Purpose/Strategy as of Year-end 2017 (\$Mil., Notional)**

Purpose	Interest Rate	Currency	Total Return	Credit Default Swap	Other	Total	Pct of Total
Hedging Other	777,381	50,202	65,256	5,967	17,656	916,463	81%
Hedging Effective	115,387	53,041	102	50	3,378	171,958	15%
Replication	16,477	640	894	28,376	66	46,452	4%
Other	1,852	-	340	-	-	2,192	0%
<b>Total</b>	<b>911,097</b>	<b>103,883</b>	<b>66,593</b>	<b>34,393</b>	<b>21,100</b>	<b>1,137,064</b>	<b>100%</b>

## Options

Table 6 shows U.S. insurers' Option exposure by type of contract and company type as of year-end 2017. Call Options (Calls) were the largest Option contract type at 40% (\$407.9 billion) of the total Options' notional value (\$1 trillion) as of year-end 2017. U.S. insurers' exposure to Calls increased 53% from 2016, due in part to the confidence in continued strength of the equity market. Calls for hedging accounted for about 97% (\$394.3 billion) of all Call transactions. Purchased Calls were the majority (80%) of Call Options. Written Calls accounted for the remaining 20%. According to paragraph 42 of SSAP No. 86, "because these transactions require writing derivatives, they expose the reporting entity to potential future liabilities for which the reporting entity receives a premium up front. Because of this risk, dollar limitations and additional constraints are imposed requiring that the transactions be "covered" (i.e., offsetting assets can be used to fulfill potential obligations)."

Put Options increased 32% to \$233 billion as of year-end 2017 from \$177.1 billion as of year-end 2016. Put Options are generally viewed as a defensive strategy.

Life companies accounted for the overwhelming majority of Option exposure at 94% of the industry total as of year-end 2017, unchanged from 2016, but up from 91% in 2015.

**Table 6: Option Exposure by Type of Contract as of Year-end 2017 (\$Mil., Notional)**

Industry	Call	Put	Cap	Other	Collar	Floor	Total	Pct of Total
Life	404,257	224,273	176,790	82,974	64,349	13,243	965,886	94%
P/C	2,967	8,857	293	40	-	45,171	57,328	6%
Fraternal	721	-	-	-	-	-	721	0%
<b>Total</b>	<b>407,945</b>	<b>233,130</b>	<b>177,083</b>	<b>83,014</b>	<b>64,349</b>	<b>58,415</b>	<b>1,023,935</b>	<b>100%</b>
Pct of Total	40%	23%	17%	8%	6%	6%	100%	

Table 7 shows the insurance industry's use of Options by type according to the risks hedged. Equity risk is the largest category at \$619.7 billion (66% of the notional value), followed by interest rate risk at \$290.3 billion (31%). With respect to managing equity risk, Calls represent the largest risk hedged for U.S. insurers, followed by Put Options and Caps. With respect to interest rate hedging, Caps were the largest risk hedged, followed by smaller exposures to Calls and Other instruments.

**Table 7: Option Exposure (for Hedging Purposes) by Type of Contract and Risk Hedged as of Year-end 2017 (\$Mil., Notional)**

Type of Contract	Call	Put	Cap	Other	Collar	Floor	Total	Pct of Total
Equity	331,357	206,093	193	35,971	46,102	-	619,716	66%
Interest Rate	49,606	10,913	176,658	44,142	500	8,449	290,268	31%
FX	1,716	3,278	146	361	17,747	-	23,247	2%
Credit and Other	-	-	-	-	-	-	-	0%
<b>Total</b>	<b>382,679</b>	<b>220,284</b>	<b>176,997</b>	<b>80,473</b>	<b>64,349</b>	<b>8,449</b>	<b>933,231</b>	<b>100%</b>

### Credit Default Swaps

As of year-end 2017, the notional value of CDSs held by U.S. insurers totaled \$34.3 billion (see Table 8), an 11% decrease from \$38.8 billion as of year-end 2016. Among U.S. insurers, life and P/C companies have been the only participants (on the asset side) in the CDS market since at least 2014, with life companies accounting for about 95% of CDSs as of year-end 2017.

**Table 8: Industry CDS Exposure as of Year-end 2017 (\$Mil., Notional)**

Industry	Seller	Buyer	Total	Pct of Total
Life	25,406	7,285	32,691	95%
P/C	936	765	1,701	5%
<b>Total</b>	<b>26,343</b>	<b>8,050</b>	<b>34,393</b>	<b>100%</b>
Pct of Total	77%	23%	100%	

CDSs can either be bought or sold for different purposes. To buy protection is to reduce (short) credit risk, and to sell (write) protection is to assume (go long) credit risk. As of year-end 2017, about \$26.3 billion (77%) of the \$34.4 billion in insurance industry CDS exposure was as a seller of protection (long credit). The remainder (\$8.1 billion) were buyers of protection (short credit). Credit sentiment among U.S. insurers vastly improved as

indicated by the ratio of bought protection at 23% of the total protection as of year-end 2017 versus 32% as of year-end 2016.

About 93% of insurers selling protection are engaging in replication (synthetic asset) transactions (RSAT). Through replication of a bond, U.S. insurers can synthetically create a security satisfying their desired risk and term exposure without the availability and other constraints of the cash bond market.

## Counterparty Exposure

As the use of central clearinghouses increases in derivative transactions, the concern over counterparty risk should diminish given the strict collateral requirements and their risk-neutral objective. Futures and listed Options trade on exchanges (such as the Chicago Mercantile Exchange listed below), which provide a similar clearing function to clearinghouses; “standardized” over-the-counter (OTC) derivatives must now clear through central clearinghouses. Bilateral CDSs are not cleared through an exchange or a central clearing house, and as such, represent significant counterparty risk.

Table 9 summarizes U.S. insurer exposures in notional value of the top 10 counterparties as of year-end 2017. The 10 counterparties represent 70% of the notional value outstanding in the U.S. insurance industry as of year-end 2017, roughly in line with prior years. (Counterparty exposure is most concentrated for P/C companies where the top 10 counterparties represent 89% of the notional value of total U.S. insurer counterparty exposure, even though life companies clearly account for the majority of overall notional value counterparty exposure.)

**Table 9: U.S. Insurers’ Largest 10 Counterparty Exposures as of Year-end 2017 (\$Mil., Notional)**

Counterparty	Life	P/C	Fraternal	Health	Total	Pct of Total
Goldman Sachs & Co	208,747	530	-	-	209,277	9%
Citibank	149,104	36,873	2	-	185,980	8%
Chicago Mercantile Exchange	149,377	8,994	-	-	158,371	7%
Bank of America Merrill Lynch	142,215	3,023	33	200	145,471	7%
JP Morgan & Company	137,734	3,962	338	-	142,035	6%
Deutsche Bank	123,260	13,764	-	-	137,024	6%
Morgan Stanley & Co	128,701	2,465	15	-	131,181	6%
Barclays Bank PLC	120,916	1,056	-	-	121,973	5%
Credit Suisse	108,132	1,319	-	-	109,451	5%
BNP Paribas	96,685	439	-	-	97,125	4%
<b>Largest 10 Total</b>	<b>1,364,873</b>	<b>72,425</b>	<b>388</b>	<b>200</b>	<b>1,437,886</b>	65%
<b>Total</b>	<b>2,146,794</b>	<b>80,681</b>	<b>1,165</b>	<b>319</b>	<b>2,228,959</b>	<b>100%</b>
Largest 10 as % of Total	64%	90%	33%	63%	65%	

## Posted Collateral

U.S. insurers report the BACV and FV of counterparty exposure in Schedule DB, Part D collateral posted to insurers is best measured in FV because the BACV does not apply to collateral pledged to an insurer in which there has not been a default.

Table 10 shows that as of year-end 2017, about \$19.3 billion in BACV of collateral was posted by insurers with counterparties (\$20.1 billion in FV), compared to \$21.8 billion in BACV (\$22.5 billion in FV) a year earlier. Counterparties posted about \$40.5 billion in FV of collateral to U.S. insurers as of year-end 2017, unchanged from 2016. Not surprisingly, life companies, as the largest users of derivatives among all U.S. insurers, accounted for the largest portion of collateral posted to counterparties at 95%.

**Table 10: The BACV of U.S. Insurer Posted Collateral as of Year-end 2017 (\$Mil.)**

<b>Collateral Type</b>	<b>Life</b>	<b>P/C</b>	<b>Fraternal</b>	<b>Total</b>	<b>Pct of Total</b>
U.S. Treasury and Agency	10,168	312	63	10,543	55%
Cash (U.S. \$)	4,632	462	-	5,094	26%
Corp Bonds - U.S.	1,909	10	-	1,919	10%
MBS - Agency	1,470	-	-	1,470	8%
Loan Backed and Structured (ABS)	243	32	-	275	1%
Municipal	-	7	-	7	0%
Other/NA	6	-	-	6	0%
<b>Total</b>	<b>18,428</b>	<b>822</b>	<b>63</b>	<b>19,313</b>	<b>100%</b>
Pct of Total	95%	4%	0%	100%	

U.S. Treasury and agency securities were the largest collateral type, comprising 55% of the total BACV as of year-end 2017. Other significant collateral types were cash (26%), U.S. corporate bonds (10%) and agency mortgage-backed securities (8%), which together accounted for about 99% of collateral posted by insurers. Note that collateral pledged to counterparties by insurers remains on their balance sheets, but the amount pledged is small compared to their total assets and is a restricted asset.

### Summary

The notional value of derivative exposure increased year-over-year by 4%, while the number of insurers reporting derivative exposure remained virtually unchanged at 311 as of year-end 2017 from 310 in 2016. Life companies continued to account for the largest derivative exposure. U.S. insurers engaged in derivative transactions mainly for hedging purposes; those hedges were predominantly to manage interest rate and currency risk.

The NAIC Capital Markets Bureau will continue to track derivative usage trends among insurers, and it will monitor developments in the derivatives market and their impact on insurance industry investments. We will report on any developments as deemed appropriate.

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